# General

## Guideline Title

Consensus statement: using laryngeal electromyography for the diagnosis and treatment of vocal cord paralysis.

## Bibliographic Source(s)

Munin MC, Heman-Ackah YD, Rosen CA, Sulica L, Maronian N, Mandel S, Carey BT, Craig E, Gronseth G. Consensus statement: using laryngeal electromyography for the diagnosis and treatment of vocal cord paralysis. Muscle Nerve. 2016 Jun;53(6):850-5. [31 references] PubMed

## Guideline Status

This is the current release of the guideline.

This guideline meets NGC's 2013 (revised) inclusion criteria.

# Recommendations

## Major Recommendations

Summary Recommendations

1. If prognostic information is required on ultimate vocal fold mobility in a patient with vocal fold paralysis that is >4 weeks and <6 months in duration, laryngeal electromyography (LEMG) should be performed.
2. LEMG may be performed to clarify treatment decisions in a patient with vocal fold immobility that is presumed to be caused by recurrent laryngeal neuropathy (RLN).

## Clinical Algorithm(s)

None provided

# Scope

## Disease/Condition(s)

- Recurrent laryngeal neuropathy (RLN)

- Vocal fold paralysis

## Guideline Category

Diagnosis

Evaluation

Treatment

## Clinical Specialty

Neurology

Otolaryngology

Physical Medicine and Rehabilitation

## Intended Users

Physicians

## Guideline Objective(s)

To develop an evidence-based consensus statement regarding use of laryngeal electromyography (LEMG) for diagnosis and treatment of vocal fold paralysis after recurrent laryngeal neuropathy (RLN)

## Target Population

Patients with acute unilateral or bilateral vocal fold paralysis after recurrent laryngeal neuropathy (RLN)

## Interventions and Practices Considered

Laryngeal electromyography (LEMG)

## Major Outcomes Considered

Recovery of vocal fold motion

# Methodology

## Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

## Description of Methods Used to Collect/Select the Evidence

In October 2012, PubMed was used to search Medline to identify all potential abstracts. The search strategy for this study included the keywords, MeSH terms, and text words. The search terms included laryngeal electromyography, motor unit recruitment, ï¬brillation potentials, positive wave

potentials, laryngeal synkinesis, turns-to-amplitude ratio, quantitative electromyography, thyroarytenoid muscle, cricothyroid muscle, lateral cricoarytenoid muscle, posterior cricoarytenoid muscle, recurrent laryngeal nerve injury, recurrent laryngeal neuropathy, and vocal fold paralysis. This produced 1,540 English-only abstracts that matched the search terms, including human and highly relevant animal studies and all age groups, published between 1960 and October 2012. Use of laryngeal electromyography (LEMG) for intraoperative monitoring of nerve activity was an exclusion criterion. Titles were reviewed for relevance, which yielded 273 articles. At least 2 investigators then reviewed abstracts for 254 publications, because 19 could not be located. This level of review resulted in 65 publications for full manuscript data abstraction. After each was reviewed in its entirety by 2 investigators, 14 were identi-ed as relevant for this guideline. To be considered relevant, the article had to describe both: (1) patients with a neurologic disease affecting the laryngeal muscles; and (2) subjects with and without LEMG abnormalities. The results of the LEMG (the index test) had to be compared with the reference standard of recovery of vocal fold motion as detected by laryngoscopy.

All included publications evaluated a minimum of 10 subjects and described the LEMG technique in detail. Studies on clinical management were required to describe how patient treatment was altered by the results of the LEMG. Studies that evaluated whether LEMG predicted recovery of vocal fold mobility were required to use laryngoscopy at the onset of symptoms and at interval recovery periods until at least 6 months after onset of symptoms. If the initial LEMG was performed >6 months after onset of injury, the data for those individual patients were excluded, because the correlation of late LEMG studies to outcomes is known to be low. Late LEMG prognostic information does not add further value, as spontaneous recovery after 6 months of paralysis is quite rare. In addition, synkinetic reinnervation could yield normal motor unit potential (MUP) recruitment without any vocal fold motion.

## Number of Source Documents

14 articles were identi-ed as relevant for this guideline.

## Methods Used to Assess the Quality and Strength of the Evidence

Expert Consensus

Weighting According to a Rating Scheme (Scheme Given)

## Rating Scheme for the Strength of the Evidence

The 14 relevant publications were rated using the American Academy of Neurology grading system.

## Methods Used to Analyze the Evidence

Meta-Analysis

Systematic Review with Evidence Tables

## Description of the Methods Used to Analyze the Evidence

The 14 relevant publications were rated using the American Academy of Neurology grading system. At each step in the process, disagreements were arbitrated by a third investigator. Some articles focused strictly on unilateral vocal fold paralysis, and some included both unilateral and bilateral paralysis. When information regarding bilateral vocal fold paralysis was reported, each individual nerve served as a separate data point in the analysis.

Meta-analysis was performed for 4 variables using a random effects model to calculate 95% confidence intervals of the risk differential. The 4 variables were positive predictive value, negative predictive value, sensitivity, and specificity, which were calculated from the 3 parameters that were most commonly investigated as predictors of recovery: presence of motor unit potential (MUPs); absence of spontaneous activity (specifically absence of positive sharp waves and/or fibrillation potentials); and presence of polyphasic MUPs. Of note, an abnormal percentage of polyphasic MUPs was described clinically in each study, but there is no uniform definition for this parameter.

## Methods Used to Formulate the Recommendations

Expert Consensus

## Description of Methods Used to Formulate the Recommendations

The American Association of Neuromuscular and Electrodiagnostic Medicine (AANEM) convened an expert panel of physicians who specialize in neurology, otolaryngology, and physical medicine and rehabilitation. This panel was selected to represent a broad range of expertise related to laryngeal electromyography (LEMG), and most participants reported using LEMG frequently for clinical and research purposes.

This evidence-based review was designed to address 2 critical questions regarding the use of LEMG after recurrent laryngeal neuropathy (RLN). First, does LEMG predict recovery in patients with acute unilateral or bilateral vocal fold paralysis? Second, do LEMG ï¬ndings change clinical management or inï¬,uence outcomes in these individuals?

## Rating Scheme for the Strength of the Recommendations

Not applicable

## Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

## Method of Guideline Validation

Internal Peer Review

## Description of Method of Guideline Validation

The article was reviewed by the American Association of Neuromuscular and Electrodiagnostic Medicine (AANEM) in January 2016 and approved by the AANEM Board of Directors on February 8, 2016.

# Evidence Supporting the Recommendations

## Type of Evidence Supporting the Recommendations

The type of evidence supporting the recommendations is not specifically stated.

# Benefits/Harms of Implementing the Guideline Recommendations

## Potential Benefits

- Laryngeal electromyography (LEMG) adds value by changing the clinical management of a patient with vocal fold paralysis approximately 48% of the time by suggesting diagnoses other than recurrent laryngeal neuropathy (RLN).
- LEMG can provide clarity between the clinical presentation of RLN versus mechanical cricoarytenoid joint abnormality, because the latter would have normal LEMG ï¬ndings.
- If LEMG data show signs of reinnervation and recovery, then this can inform the patient and clinician to pursue a continued period of observation or to use a temporary treatment (e.g., vocal fold injection with a material that dissipates in 2 to 3 months). If the LEMG data reveal a poor prognosis based on lesion severity, permanent surgical treatment can be offered sooner for appropriate patients. Treatment of bilateral vocal fold paralysis generally is irreversible, involving destruction of some part of the vocal fold and/or arytenoid to enlarge the glottic airway. Information provided by LEMG before embarking on this permanent surgical treatment also may help select a side for the

surgical intervention.

### Potential Harms

Not stated

## Qualifying Statements

### Qualifying Statements

This study was prepared by the Professional Practice Committee of the American Association of Neuromuscular and Electrodiagnostic Medicine (AANEM) and did not undergo a separate review process from *Muscle & Nerve*.

## Implementation of the Guideline

### Description of Implementation Strategy

An implementation strategy was not provided.

## Institute of Medicine (IOM) National Healthcare Quality Report Categories

### IOM Care Need

Getting Better

Living with Illness

### IOM Domain

Effectiveness

## Identifying Information and Availability

### Bibliographic Source(s)

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### Adaptation

Not applicable: The guideline was not adapted from another source.

## Date Released

2016 Jun

## Guideline Developer(s)

American Association of Neuromuscular and Electrodiagnostic Medicine - Medical Specialty Society

## Source(s) of Funding

American Association of Neuromuscular and Electrodiagnostic Medicine (AANEM)

## Guideline Committee

Professional Practice Committee of the American Association of Neuromuscular and Electrodiagnostic Medicine (AANEM)

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## Financial Disclosures/Conflicts of Interest

Not stated

## Guideline Status

This is the current release of the guideline.

This guideline meets NGC's 2013 (revised) inclusion criteria.

## Guideline Availability

Available from the American Association of Neuromuscular and Electrodiagnostic Medicine (AANEM) Web site .

## Availability of Companion Documents

None available

## Patient Resources

None available

## NGC Status

This NGC summary was completed by ECRI Institute on January 18, 2017. The information was not verified by the guideline developer.

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